

Remarks:

In the Office Action mailed on November 15, 2006, the Examiner objected to Claims 5-7, 10, 12-13 and 16. The Examiner rejected Claims 1, 14, 15, 17, 19 and 20. Claims 1 and 16 are amended herein to correct minor errors in the previously presented version of these claims. Claims 1, 5-7, 10, 12-17, 19 and 20 are pending in the application.

35 USC 103

Claims 1, 14-15, 17 and 19-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cloud et al. (US 5,714, 802) in view of Ishikawa et al. (US 5,394,014). Applicants traverse the rejection.

Applicants claim “a chip ... comprising ... additional layer of silicon ... covering at least part of said active face, the additional layer of silicon comprising physical means for providing physical protection against the action of electromagnetic radiation in the infrared range at a wavelength longer than 1 μm .” Neither Cloud nor Ishikawa claim or suggest such an element.

Cloud describes an electronic module that contains multiple silicon wafers that are stacked on top of each other. These stacked wafers are mechanically joined as well as electrically coupled to one another. In Cloud, each wafer is a component of the overall electrical system. Consider, for example, that “after the wafers 30, 32 are mechanically joined, the circuitry 40 on top of the wafers 30, 32 are electrically coupled, the pattern of connection depending on the design of the component” (Cloud, Col. 6, lines 1-4). In an application suggested in Cloud “a plurality of square wafer sections, for instance, could be enjoined in the manner described. If the wafer sections contain different types of logic, for instance a microprocessor, cache memory, and static random access memory, a very compact, high-speed logic device could be supplied.” Cloud, Col. 7, lines 61-67. In such a circuit is imperative for the correct operation of the device that all sections operate correctly. Thus, if the device is subjected to an electromagnetic radiation that is capable of interfering with the correct operation of a silicon based circuit and the device relies on

one of the wafers in the component for shielding against electromagnetic radiation, that shielding wafer would become interfered with itself. Thus, a person of ordinary skill in the art would not be motivated to use Cloud's structure for the purpose of providing the shield claimed in the present invention, for example, because such a use of a wafer in the Cloud device would interfere with the intended purpose of that wafer.

Furthermore, there is not a scintilla of a hint in Cloud that the wafers disclosed therein provide the desired protection. Applicants claim "the additional layer of silicon comprising physical means for providing physical protection against the action of electromagnetic radiation in the infrared range at a wavelength longer than 1 μm ."

However, Cloud does not teach or suggest that the wafers therein provide such protection. Accordingly, Cloud fails to teach or suggest this element of Claim 1.

The Examiner argues that teaching missing from Cloud may be found in Ishikawa. Applicants disagree. Ishikawa teaches various embodiments for providing light shielding to a chip. However, in no instance does Ishikawa teach or suggest "an additional layer of silicon that is sealed to the active face of the silicon substrate layer by a sealing layer" (Claim 1). Consider Figure 1 of Ishikawa, "a semiconductor chip 2 ... housed in a molded resin package 1" (Ishikawa, Col. 4, lines 42-45). "A light shielding seal 5 is bonded onto the upper surface of the resin package 1" (Col. 4, lines 47-48). Thus, the light shield is positioned outside of the resin package rather than sealed to the active face of the silicon substrate layer.

The Examiner also points to Figure 6 and layer 61. However, layer 61 is a "polyimide mixed with carbon black" (Col. 5, lines 53-54). Thus, layer 61 cannot properly be considered an "additional layer of silicon".

Thus, a combination of Cloud and Ishikawa would not teach or suggest "an additional layer of silicon that is sealed to the active face of the silicon substrate ... physical means for providing physical protection against the action of electromagnetic radiation in the infrared range at a wavelength longer than 1 μm " (Claim 1).

The Examiner has argued that the motivation to combine the Cloud and Ishikawa references may be found in the paragraph spanning Columns 1 and 2 of Ishikawa.

However, that is not a correct reading. Ishikawa states that “a conventional resin package for a semiconductor device has a sufficient thickness for intercepting light, the thickness of a resin material forming a TSOP [(thin small outline packages)] is so small that light may reach a semiconductor chip.” Thus, only if a person was working on such packages being prone to interference from light, would that person be motivated to employ solutions found in Ishikawa. Cloud does not disclose its applicability to TSOP devices. In fact, more than likely the contrary is the case, in that Cloud discusses devices that are a stack of wafers. There is no discussion in Cloud of the resin molds in which the stack of wafers would be contained. Thus, there is no reason to believe that a person using Cloud’s techniques would be concerned about light interfering with the operation of the stack of wafers. Thus, there is no motivation to combine the teachings of Cloud and Ishikawa.

As noted a person of ordinary skill in the art would not be motivated to combine the teachings of Cloud and Ishikawa. Furthermore, even if such a combination were attempted, that combination would not include all the elements of the claimed invention. Therefore, Claim 1 is not obvious over the combination of Cloud and Ishikawa, whether these references are taken singly or in combination.

Claim 20 recites analogous limitations to Claim 1 and is patentable over Cloud and Ishikawa for at least the same reasons as those provided hereinabove in support of Claim 1.

Claims 14, 15, 17, and 19 depend from Claim 1, inherit all the limitations thereof, provide further unique and non-obvious combinations, and are patentable over Cloud and Ishikawa for the reasons given in support of Claim 1 and by virtue of such further combinations.

Allowable Subject Matter/Claim Objections

Claims 5-7, 10, 12-13 and 16 are objected to as being dependent upon a rejected base claim but indicated that these claims recite patentable subject matter if rewritten in

independent form. In light of the above arguments, Applicants decline to rewrite these claims as suggested at the present time.

CONCLUSION

It is submitted that all of the claims now in the application are allowable. Applicants respectfully request consideration of the application and claims and its early allowance. If the Examiner believes that the prosecution of the application would be facilitated by a telephonic interview, Applicants invite the Examiner to contact the undersigned at the number given below.

Applicants respectfully request that a timely Notice of Allowance be issued in this application.

Respectfully submitted,

Date: January 16, 2007

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